Remarks

The Office Action mailed November 9, 2005 has been reviewed and the following remarks have been made in consequence thereof.

Claims 1, 3-11, and 13-20 are now pending in this application. Claims 1, 3-11, and 13-20 are rejected. Claims 2, 12, and 21-23 have been canceled. No new matter has been added.

The rejection of Claims 1, 3-12, and 13-20 under 35 U.S.C. § 103(a) as being unpatentable over Possin et al. (U.S. Pat. No. 6,167,110) in view of Hu et al. (U.S. Pat. No. 5,510,622) and Cusano (U.S. Pat. No. 4,187,427) is respectfully traversed.

Possin et al. describe a two-dimensional detector (20) for high voltage x-rays that includes a plurality of sensor elements (22) wherein each sensor element is aligned along a respective focal axis (25) with respect to a high voltage x-ray source (24). The detector also includes a fiber optic scintillator (34) that is optically coupled to each of the sensor elements and is disposed to receive incident x-ray radiation passing from the object to be imaged. Optical fibers of the scintillator are positioned such that their optical axes are perpendicular to incident x-rays.

Hu et al. describe a two-dimensional x-ray detector 16 wherein the detector elements are arranged in rows and columns. The detector array includes square detector elements 18 which are rotated 45 degrees about their centers. As a result, the centers of detectors 18 in adjacent columns are staggered as shown by line 42, and the centers of detectors 18 in adjacent rows are also staggered as shown by line 43. Consequently, the distance between centers of detector elements as measured along both the z and x axes are reduced to 0.707 the pitch of a corresponding prior art detector array using the same size detector elements. This is roughly a 30% reduction in the effective detector pitch along both the x and z dimensions of the two-dimensional detector array 16.

Cusano describes a collimated scintillator detector array structure that includes a plurality of collimator members 14 that each have a front wall member 12 and rear wall member 16 that define a series of volumes into which a variety of scintillator

bodies 10 may be placed. Cusano also describes that a plurality of photoelectrically responsive detectors 18, such as silicon photodiodes, are mounted on the top and on the bottom of each detector cell. Cusano further states that "**the detectors 18 are carefully aligned with collimator members 14 so that no signal overlap occurs between adjacent detector cells to facilitate reducing an undesirable loss in signal resolution**."

Applicant respectfully submits that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Neither Possin et al., Hu et al, nor Cusano, considered alone or in combination, describe or suggest the claimed combination. Furthermore, in contrast to the assertions within the Office Action, Applicant respectfully submits that it would not be obvious to one skilled in the art to combine Possin et al., Hu et al, and Cusano, because there is no motivation to combine the references suggested in the art. Additionally, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicant's own teaching. Rather, only the conclusory statement that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the radiation detector of Possin et al. to offset a first array 22 from a second array 22 by one-half the pitch of detectors 23," suggests combining the disclosures.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention.

Specifically, Possin et al. is cited for teaching a radiation detector having a first and second array. Moreover, while the Office Action asserts that "the radiation detector of Possin et al. have no particular detector alignment," Applicant respectfully traverses this assertion. Possin et al. clearly describe a two-dimensional radiation detector that "comprises 2048 focally aligned sensor elements 22 in array having a pitch of 100 microns (or .mu.n) (i.e., separation between adjacent sensor elements)." Hu et al. is cited for teaching a two-dimensional radiation detector wherein the detector elements are offset by one-half detector pitch.

If art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. Specifically, Applicant respectfully submits that Cusano teaches away from the present invention, and as such, there is no suggestion or motivation to combine Possin et al., Hu et al. and Cusano. Specifically, in contrast to both Possin et al. and Hu et al., Cusano does not describe a planar or two-dimensional detector, rather, Cusano describes a detector wherein the detecting elements are positioned at the top and bottom of the scintillator. Moreover, Cusano further describes that in this configuration, **the detectors 18 are carefully aligned with collimator members 14 so that no signal overlap occurs between adjacent detector cells to facilitate reducing an undesirable loss in signal resolution.**

As such, Applicant respectfully submits that no combination of Possin et al., Hu et al., and Cusano teach a radiation detector that includes a first and second array that are coupled on opposite sides of a scintillator and wherein the first array is offset from the second array by one-half detector pitch.

Further, and to the extent understood, none of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination. Specifically, Claim 1 recites a radiation detector, the radiation detector comprising "a first array comprising a first photon incident surface; a second array comprising a second photon incident surface; and a scintillator array extending from said first photon incident surface to said second photon incident surface, wherein said first and second arrays are separated from each other by said scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction, said first and second arrays are located within the same radiation detector.

None of Possin et al., Hu et al., and Cusano, alone or in combination, describe or suggest the radiation detector recited in Claim 1. Specifically, none of Possin et al., Hu et al., or Cusano describe first and second arrays that are separated from each other by a scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction. Rather, in contrast to the present invention, Cusano specifically describes a radiation detector wherein **the detectors 18 are carefully aligned with collimator members 14 so that no signal overlap occurs between adjacent detector cells to facilitate reducing an undesirable loss in signal resolution.** For at least the reasons set forth above, Claim 1 is submitted to be patentable over Possin et al in view of Hu et al. and Cusano.

Claims 3-9 depend from Claim 1. When the recitations of Claims 3-9 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 3-9 likewise are patentable over Possin et al. in view of Hu et al. and Cusano.

Claim 10 recites a radiation detector that includes "a first array comprising a first photon incident surface and a plurality of sensor elements having an aperture pitch size; a second array comprising a second photon incident surface and a plurality of sensor elements having the aperture pitch size; and a scintillator array extending from said first photon incident surface to said second photon incident surface, said scintillator array is configured to direct at least a portion of a plurality of optical photons to said first photon incident surface and said second photon incident surface, said scintillator comprising a fiber optic scintillator having a plurality of optical fibers bundled in an array and disposed such that said x-rays are incident on said fiber optic scintillator substantially perpendicular to a respective optical axis of said plurality of optical fibers, said fiber optic scintillator further being optically coupled to at least two of said sensor elements such that said sensor elements are disposed at both ends of the plurality of optical fibers, wherein said first and second array sensor elements are separated from each other by said scintillator array and are offset from each other by approximately one-half the aperture pitch size, said first and second array sensor elements are located within the same radiation detector."

None of Possin et al., Hu et al., or Cusano, alone or in combination, describe or suggest the radiation detector recited in Claim 10. Specifically, none of Possin et al., Hu et al., or Cusano describe first and second arrays that are separated from each other by said scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction. Rather, in contrast to the present invention, Cusano specifically describes a radiation detector wherein **the detectors 18 are carefully aligned with collimator members 14 so that no signal overlap occurs between adjacent detector cells to facilitate reducing an undesirable loss in signal resolution**. For at least the reasons set forth above, Claim 10 is submitted to be patentable over Possin et al in view of Hu et al. and Cusano.

Claim 11 recites a method for fabricating a radiation detector, the method comprising "fabricating a first array including a first photon incident surface; fabricating a second array including a second photon incident surface; positioning a scintillator array between the first array and the second array such that the scintillator extends from the first photon incident surface to the second photon incident surface; and placing, within the same radiation detector, the first and second arrays such that

the arrays are separated from each other by the scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction."

None of Possin et al., Hu et al., or Cusano, alone or in combination, describe or suggest the method recited in Claim 11. Specifically, none of Possin et al., Hu et al., or Cusano describe first and second arrays that are separated from each other by said scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction. Rather, in contrast to the present invention, Cusano specifically describes a radiation detector wherein **the detectors 18 are carefully aligned with collimator members 14 so that no signal overlap occurs between adjacent detector cells to facilitate reducing an undesirable loss in signal resolution**. For at least the reasons set forth above, Claim 11 is submitted to be patentable over Possin et al in view of Hu et al. and Cusano.

Claims 13-19 depend from Claim 11. When the recitations of Claims 13-19 are considered in combination with the recitations of Claim 11, Applicant submits that dependent Claims 13-19 likewise are patentable over Possin et al. in view of Hu et al. and Cusano.

Claim 20 recites a method for fabricating a radiation detector, the method comprising "fabricating a first array including a first photon incident surface including a plurality of sensor elements including a plurality of photosensor devices; fabricating a second array including a first photon incident surface including a plurality of sensor elements including a plurality of photosensor devices; positioning a scintillator array between the first array and the second array such that the scintillator extends from the first photon incident surface to the second photon incident surface, the scintillator array is configured to direct at least a portion of a plurality of optical photons to the first photon incident surface and the second photon incident surface, the scintillator including a fiber optic scintillator including a plurality of optical fibers bundled in an array and disposed such that the x-rays are incident on the fiber optic scintillator substantially perpendicular to a respective optical axis of the plurality of optical fibers, the fiber optic scintillator further being optically coupled to at least two of the sensor elements such that the sensor elements are disposed at both ends of the plurality of optical fibers; and placing, within the same radiation detector, the first and

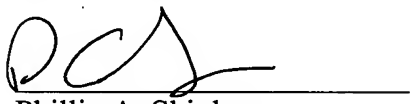
second arrays such that the arrays are separated from each other by the scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction."

None of Possin et al., Hu et al., or Cusano, alone or in combination, describe or suggest the method recited in Claim 20. Specifically, none of Possin et al., Hu et al., or Cusano describe first and second arrays that are separated from each other by said scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction. Rather, in contrast to the present invention, Cusano specifically describes a radiation detector wherein **the detectors 18 are carefully aligned with collimator members 14 so that no signal overlap occurs between adjacent detector cells to facilitate reducing an undesirable loss in signal resolution**. For at least the reasons set forth above, Claim 20 is submitted to be patentable over Possin et al in view of Hu et al. and Cusano.

For the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 1, 3-11, and 13-20 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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